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circuit and output impedance of the post-stage circuit are set so as to match external impedance in a frequency range of at least one figure; and output impedance of the pre-stage circuit and input impedance of the post-stage circuit are set to match at impedance lower than the output impedance of the post-stage circuit.

In this case, the signal delivered from the pre-stage circuit may be directly supplied to the post-stage circuit or may first pass, for example, a capacitor or other circuit to be supplied thereafter to the post-stage circuit.

In the configuration according to the invention ~~described in claim 1~~, the input impedance of the pre-stage circuit and the output impedance of the post-stage circuit match the external impedance in a one or more-digit frequency range, and the output impedance of the pre-stage circuit matches the input impedance of the post-stage circuit at impedance lower than the output impedance of the post-stage circuit. This consequently suppresses lowering of the cut-off frequency and deterioration of the input reflection loss which are caused by an increase in the size and the number of stages of transistors to obtain high voltage amplitude, and a high gain and a high power output can be attained in a wide band, for example, from several tens of kHz to several tens of GHz (a frequency range of about six figures).

In accordance with the invention ~~described in claim 2~~, in the signal amplifier ~~according to claim 1,~~ the post-stage circuit includes a traveling-wave amplifier.

In accordance with the invention ~~described in claim 2~~, since the input impedance of the post-stage circuit becomes lower, the input reflection loss characteristic can also be improved even when the size and the number of stages of transistors (or FETs)

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are increased in the traveling-wave amplifier.

In accordance with the invention ~~described in claim 3~~, in the signal amplifier ~~according to claim 1 or 2~~, the pre-stage circuit is configured to include an impedance transforming circuit.

In accordance with the invention ~~described in claim 4~~, in the signal amplifier ~~according to claim 3~~, the impedance transforming circuit is configured to include a traveling-wave amplifier.

In accordance with the invention ~~described in claim 5~~, in the signal amplifier ~~according to claim 3~~, the impedance transforming circuit is configured to include an emitter follower circuit or a source follower circuit.

In accordance with the invention ~~described in claim 6~~, in the signal amplifier ~~according to claim 3~~, the impedance transforming circuit is configured to include a differential circuit.

In accordance with the invention ~~described in one of claims 3 to 6~~, the output impedance of the pre-stage circuit can be lower than the input impedance of the pre-stage circuit by use of the impedance transforming circuit. Therefore, it is possible to match the output impedance of the pre-stage circuit with the input impedance of the post-stage circuit at low impedance.

In accordance with the invention ~~described in claim 7~~, in the signal amplifier according to one of ~~claims 1 to 6~~, an output section of the pre-stage circuit is coupled via a capacitor with an input section of the pre-stage circuit.

In accordance with the invention ~~described in claim 7~~, a signal in a desired band can be transmitted from the pre-stage circuit to the post-stage circuit.

In accordance with the invention ~~described in claim 8~~, in

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the signal amplifier ~~according to one of claims 1 to 7~~, the pre-stage circuit and the post-stage circuit are formed on the same substrate.

In accordance with the invention ~~described in claim 8~~, there can be provided an integrated circuit capable of obtaining a high gain and a high power output in a wide band ranging from several tens of kHz to several tens of GHz (a frequency range of about six figures).

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a diagram showing an outline of a configuration example of a conventional traveling-wave amplifier (traveling-wave amplifier circuit).

FIG. 2 is a diagram showing an outline of a configuration example of a conventional traveling-wave amplifier (traveling-wave amplifier circuit).

FIG. 3 is a graph showing frequency characteristics of a gain (S_{11}), input reflection (S_{21}), and output reflection (S_{22}) of the traveling-wave amplifier shown in FIG. 2.

FIG. 4 is a diagram showing an outline of a configuration example of a signal amplifier in a first embodiment.

FIG. 5 is a diagram showing a concentration constant circuit in a traveling-wave amplifier of a post-stage circuit 11.

FIG. 6 is a diagram showing comparison of frequency characteristics of a gain G (S_{11}), input reflection (S_{21}), and output reflection (S_{22}) between the case where the traveling-wave amplifier is configured in one stage as in the prior art and the case where the system includes a signal amplifier 1.

FIG. 7 is a diagram showing an outline of a configuration